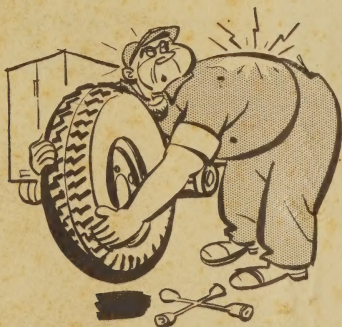


CARE OF THE BACK

INDUSTRIAL EDITION

William K. Ishmael, M.D., F.A.C.P.

Howard B. Shorbe, M.D., F.A.C.S.



J. B. LIPPINCOTT COMPANY

PHILADELPHIA AND TORONTO

Copyright © 1962, by J. B. Lippincott Company

This book is fully protected by copyright and, with the exception of brief extracts for review, no part of it may be reproduced in any form without written permission from the publishers

Reprinted June 1967

Cartoons by Ken Colgan
Oklahoma City, Oklahoma

PRINTED IN THE UNITED STATES OF AMERICA

INTRODUCTION

A man's best friends are his wife, his back, and his dog. The back, however, has a reputation of not being as faithful as his other two friends.

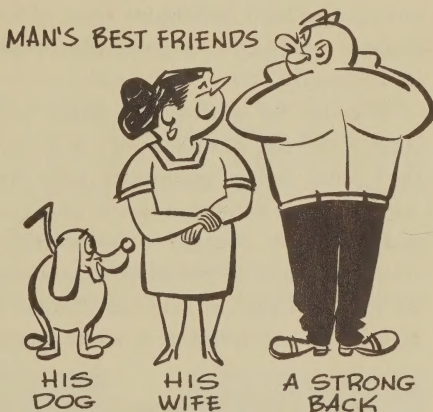
At most times when a back is sore, it is because the spinal structures have been forced to do more than they have the strength to do. This amounts to a strain. Back strains, as strains anywhere else, should heal when rested. The back, however, has the bad reputation of not healing after a strain or injury. **This need not be.** The strain which fails to heal is most likely being repeatedly restrained before healing can take place. This is similar to stubbing a hurt toe, over and over again.

In most areas of the body, rest is simply a matter of not using the part, but in the back, strain and fatigue can occur while "doing nothing," such as lying or sitting down. In this manual the authors point out specific things done by the average working man that fatigue, strain, and restrain the back.

WILLIAM K. ISHMAEL, M.D., F.A.C.P.

HOWARD B. SHORBE, M.D., F.A.C.S.

Oklahoma City, Oklahoma



WHAT CAUSES STRAIN?

There are three things that add up to a strain.

1. The size of the job that the back has to do. (This booklet points out the more common strains.)

2. The amount of strength the back has to do that job. (A weak or sick back strains easily.)

3. The way a man goes about his job, bending or twisting in awkward positions; hurrying, quick, rough motions; or a "never say die" attitude of not giving up when tired. A man who does a full day's work and then turns around and does another day's work without resting may expect trouble. "Tractor backs" were unheard of until headlights were placed on tractors which allow men to plow both day and night.

In order for a strain or direct injury to a back to heal, it is necessary to protect the part from being restrained until healing takes place. Yet for a back to be strong and regain its strength after an injury has healed, it must be put back to use properly by the right kind of exercise. **Proper exercise is the salvation of a weak back.**



Something must give if you plow both day and night.



Remember, the same shovel that causes callouses also causes blisters. Know how to exercise your back to produce strength, not strain. If you do not understand the exercises or any part of this manual, ask your physician to explain it to you.

WHY IS THE LOW BACK EASILY STRAINED?

The mechanical problems of the lower back may be seen in these illustrations:

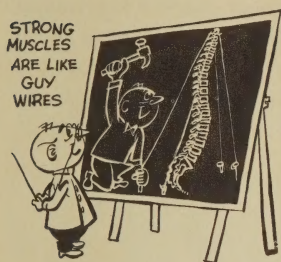


FIG. 1. Normal.

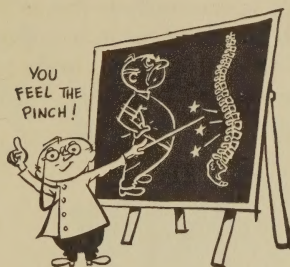


FIG. 2. Lordosis.

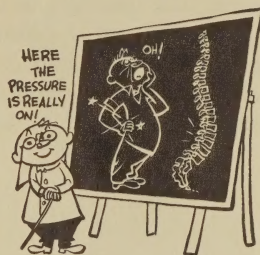


FIG. 3. Lordosis with ruptured disc.

The spine is a stack of blocks forming a column with a cartilage cushion (disc) between each block. Coming out of the back side at each disc level are the nerves which carry pain and regulate muscles. When this column of blocks bulges forward, the back sides of each block are forced closer together. If the cartilage cushion holding each block apart gives way, it allows the back side of the blocks to come closer together, pressing on the nerves coming out between them. This pressure on the nerves may cause pain and muscle spasm.

Guy wires in the form of muscles and ligaments attach to each vertebral block, holding it in position. If the front guy wires (abdominal muscles) become lax, this allows the lower back to sag forward, causing the strain problem described above.



FIG. 4. X-ray picture of a normal lower back. When the vertebrae are stacked straight up more weight may be borne.



FIG. 5. X-ray picture of swayback (lordosis). When weight is applied, the vertebrae tend to bulge forward.

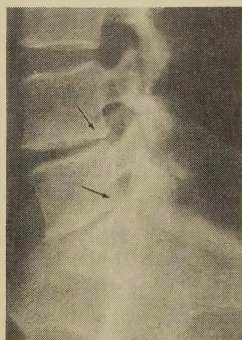


FIG. 6. Swayback with loss of cartilage cushion between vertebrae. This narrows the space through which the nerves pass.

WHAT HAPPENS WHEN THE LOW BACK IS STRAINED?

Low back pain is a common complaint and is due chiefly to the manner in which this area of the body is constructed. The spine must support the weight of the body, yet be able to bend or twist in any direction. Unfortunately, most of this motion occurs in the lower back and neck, where this swayed-forward mechanical problem already exists. This results in these areas being unusually susceptible to strain, fatigue, and pain.

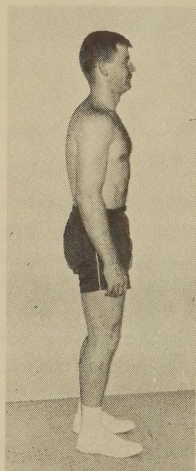


FIG. 7. Good posture.

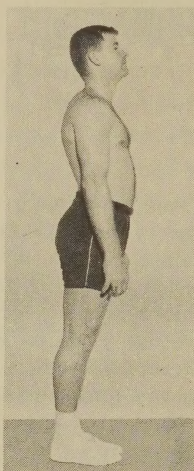


FIG. 8. Swayback (lordosis)

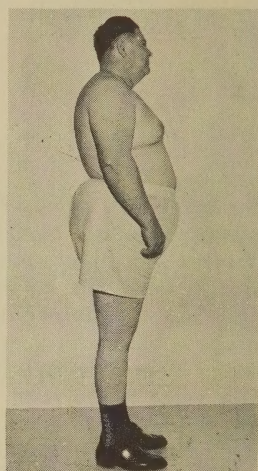


FIG. 9 Stoop (kyphosis) in upper back results in sway in lower back, all increased by obesity.

Some develop a more than average degree of curve in the low back. (Figs. 5 and 8.) Such a person is unusually susceptible to strain (weak back). If injury or repeated stress to the cartilage disc occurs (degenerated or ruptured disc), severe disability may result with a painful catch (lumbago) in the low back and intense pain in the back of the leg (sciatica). Between these episodes, the back may be chronically sore, stiff, and achy with less severe attacks of "cricks" and catches (unstable lumbosacral joint). Occasionally, surgical procedures are necessary to correct backs of this nature, but even after operation, it is necessary to protect the back from strain. Quite often conservative management can eliminate the pain.

When there is pain in the low back, there is likely, sooner or later, to be a similar strain in the neck. That portion of the spine also has a forward curve and must move in all directions and is subject to the same mechanical problems as the low back. Neck "cricks," headaches, dizziness, shoulder-arm pain, and sometimes "crazy" feelings in the head may result.

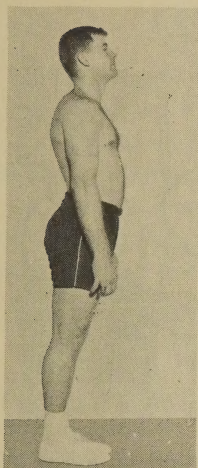


FIG. 10. Swayback (lordosis).



FIG. 11. Rails weren't built around bars for nothing.

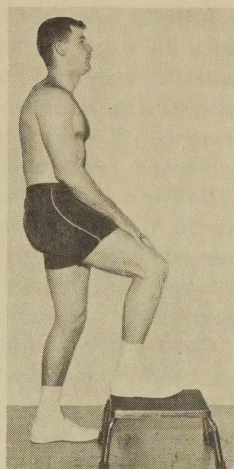


FIG. 12. Placing one foot on a stool flexes the hip and knee, relieving swayback.

FACTORS WHICH WEAKEN THE SPINE AND ALLOW IT TO STRAIN EASILY

Lack of exercise softens or weakens a back and then if some unaccustomed exercise is performed, stiffness and soreness will result. These reactions do not necessarily appear while the strain is occurring but on the following day, and may persist for a long time. **Any working man who contemplates a new job requiring unaccustomed use of his back must "train" for it just as any athlete would condition himself before entering the game.** Outdoor walking is hard to beat for increasing general muscle tone. The "sitting up" exercises given in the Armed Services are best to strengthen specific back muscles. If your back is already weak or sore, however, start first with the special conditioning exercises described on pages 19-21.



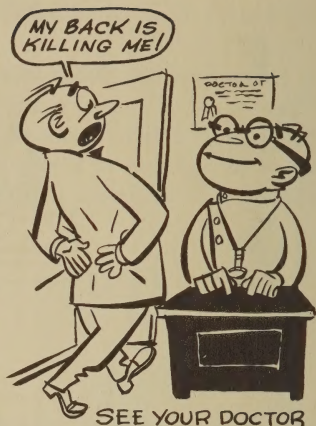
Arthritis and rheumatism may weaken or inflame the back structures and contribute to back pain. Stiffness and soreness, which are worse upon arising in the morning, strongly indicate the presence of some form of arthritis. If persisting and severe, your physician should be contacted.

Deficiencies involving the structures making up the back may serve to weaken it. A lack of calcium, protein, vitamins, and other factors would not only weaken the back, but cause generalized weakness. A normal diet is important.

Generalized conditions such as diabetes, stomach and intestinal disorders, kidney disease, nervousness, or any upset in the general health can increase back weakness and lack of stamina.

Infections may affect the back and produce weakness or inflammation. If there has been inflammatory rheumatism (rheumatic fever) in childhood, or significant "growing pains," and if now there are "night sweats," night pain, general aching and a marked "below-par" feeling, possibly an infection is present. Again, this requires consultation with your physician.

Chronic exhaustion is probably the most frequent contributing factor to back pain. An individual who sleeps 5 hours a night may as well stay up all night every other night. The man who puts in a good 8 hours a day and then rushes into another job, keeping him up too late at night, and then is so overly tired he can't sleep, is creating a strain. If he does this night after night, he is asking for trouble. Some individuals "key up" when tired instead of getting sleepy and lazy, and this may spur them on harder. Many chronic back sufferers are of this nature and cannot get well until they stop getting so overly tired they can't sleep. **It takes 8 hours sleep each night to heal a back properly.**



Men who work night shifts must not fail to get ample sleep in the daytime.

DO'S AND DON'TS

To correct a back problem, it is necessary to remedy the 3 causative factors:

1. Avoid strain or improper use of the back (aggravate swayed position).
2. Correct weakening factors (lack of use, deficiencies, arthritis, infections, etc. . . .).
3. Stop forcing your back, and body in general, from going on and on, beyond all endurance and then losing sleep.

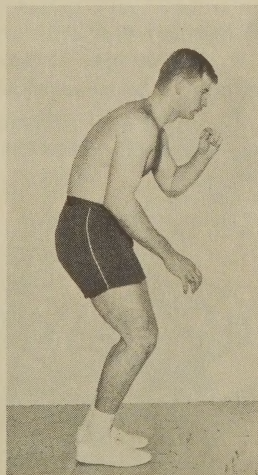
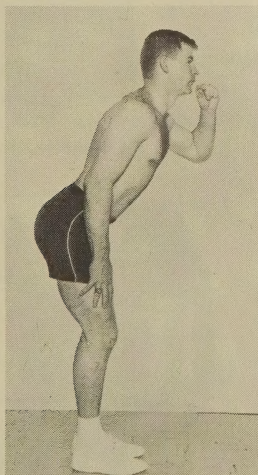
HOW TO AVOID STRAINING THE BACK

1. Ordinary standing (Fig. 13) strains the back. (A soldier can march longer than he can stand at attention.) When you have to stand, bend the hip and knee by placing your foot upon something (Figs. 11 and 12). Flexing the hip and knee corrects the swayback and partially relieves the strain.

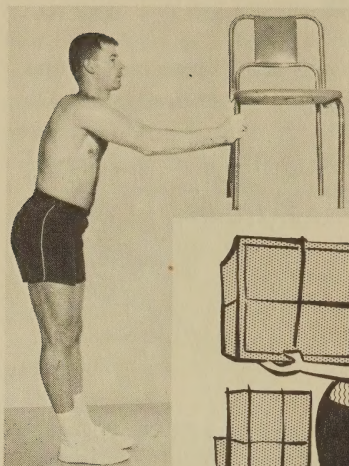
2. Never lean forward to pick up something without bending the knees. Better yet, squat down and lift with your leg muscles. Leaning forward, or lifting with the knees straight produces two harmful effects: the lift must be done by the low back muscles which aren't built for it and as the back approaches the upright position, the lower back sways in.



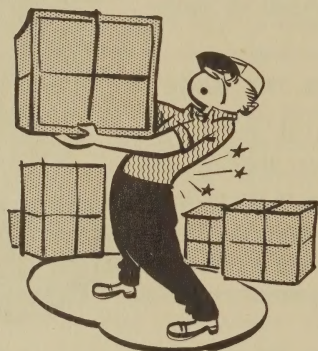
FIG. 13.



FIGS. 14 and 15. When leaning forward always bend knees to help avoid back sway.



FIGS. 16-18. Avoid lifting weights high and away from body.

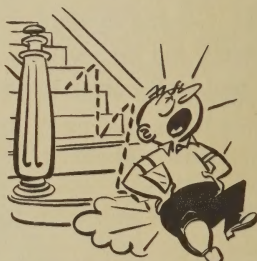


4. Watch out for your feet slipping, especially when lifting, as sudden jerks to the back may produce sharp pain that "stops you dead in your tracks."

5. When lifting a load with another person, lift together and lower your load together.

6. The danger of injuring your back from falling cannot be overemphasized.

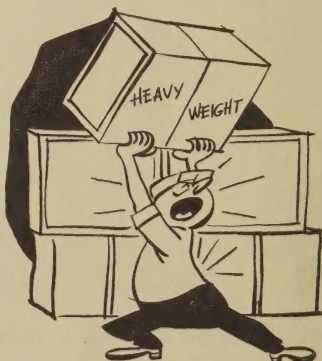
7. Lifting and twisting with a load is dangerous—turn with your feet.



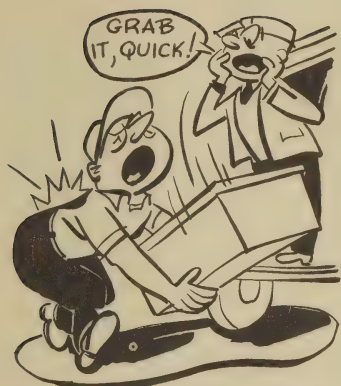
BE CAREFUL, DON'T FALL



DON'T LET 'EM GET THE DROP ON YOU

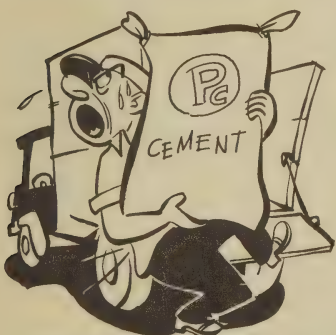


DON'T LIFT AND TWIST

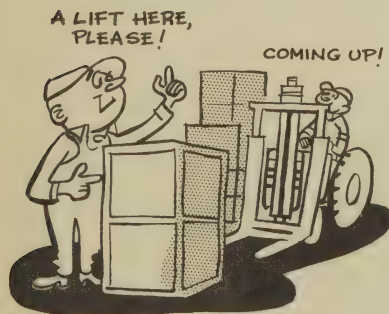


DON'T CATCH HEAVY OBJECTS

9. Don't injure your neighbor by careless handling of materials or equipment that might strike him in the back.

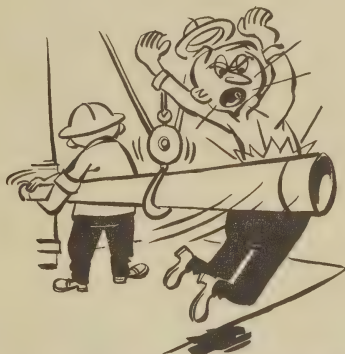


DON'T LIFT TOO MUCH WEIGHT



12. "Horse play," or "showing off" has injured many backs.

8. Catching a falling weight is dangerous to your back. If it is a necessary part of your job, do so with your knees bent, back straight, and feet firmly placed.



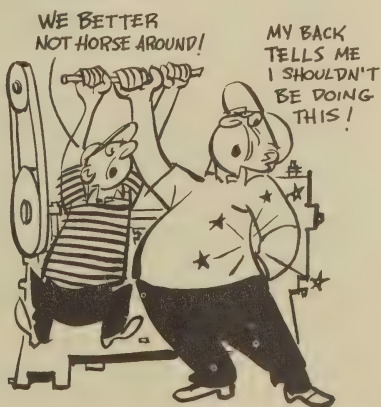
IT'S NO PIPE TO GET HIT IN THE BACK

10. Use caution when pushing or pulling a heavy object.

- You may twist your back.
- Sway it excessively under a heavy load.
- Your feet may slip.
- You may jerk your back when trying to move the load.

11. Don't lift a load that is too heavy for your back, even though you do it properly.

Send for help.



MY BACK TELLS ME I SHOULDN'T BE DOING THIS!

BAD SLEEPING HABITS

It is true that some of our worst back strains occur while we are sound asleep. Many chronically sore backs are perpetuated by the strain which occurs while sleeping and feel their worst after a night's rest.

Most back sufferers have learned that it is important not to rest in a soft bed that sags like a hammock.



FIG. 19. Don't sleep in a bed that is made like a hammock.

Place boards or a suitable support between the mattress and springs of your bed if you awaken in worse shape than when you went to bed. If you are staying in a hotel or home where the bed is too soft, you're better off sleeping on the floor.



FIG. 20. Sleeping prone increases swayback and twists the neck. Don't do it!



FIG. 21. Lying straight on bed increases back sway, causing strain.



FIG. 22. Do not lie on back with feet on stool and head on high pillow as this strains both the low back and the neck.

GOOD SLEEPING HABITS

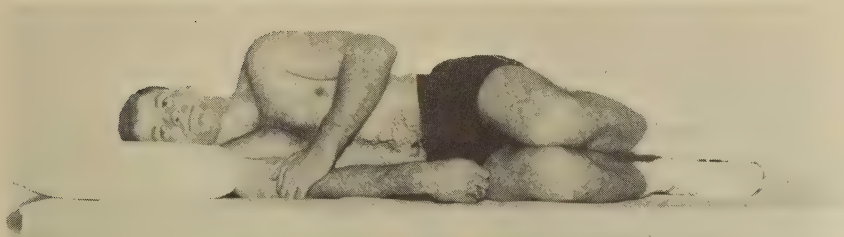


FIG. 23. Lying on one's side with hips and knees bent relieves the swayback. This is one of the proper ways to sleep.

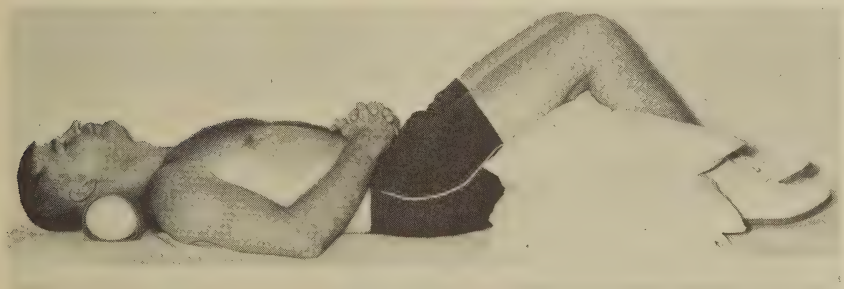


FIG. 24. Note that an object placed under the knees relieves the swayback when the model lies on his back. This is an excellent way to sleep if you have a weak or sore back.



FIG. 25. Placing an 8-inch deck under the lower end of the mattress will make a permanent method of flexing the knees and hips. It also prevents lying on the abdomen.

SITTING STRAINS

The principles of avoiding increased sway in the low back by keeping the hips and knees flexed apply while sitting as well as they do in standing or lying down.

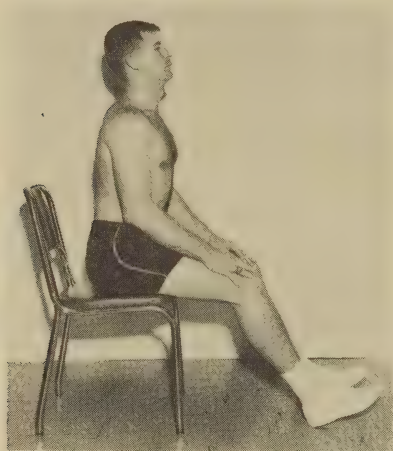


FIG. 26. Sitting in a chair that is too high increases the swayback. The knees are lower than the hips.

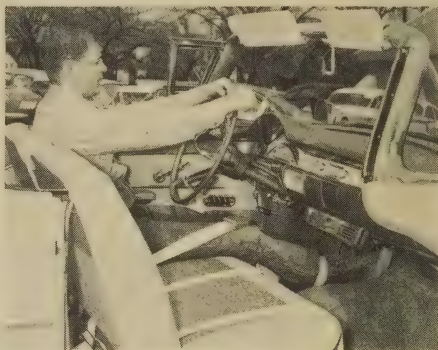


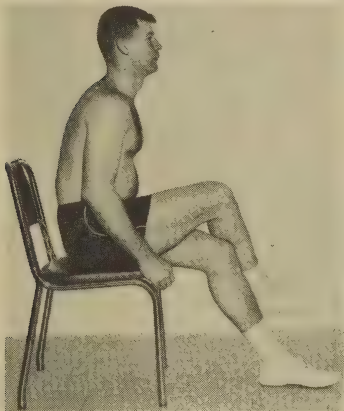
FIG. 27. When the car seat is too far back, as shown here, the legs are almost straight and the low back is curved. To avoid this keep the seat forward enough to keep knees bent. In a truck or tractor this is difficult so periodic rests by shifting position or getting out to stretch are helpful. Seat belts should be fastened!



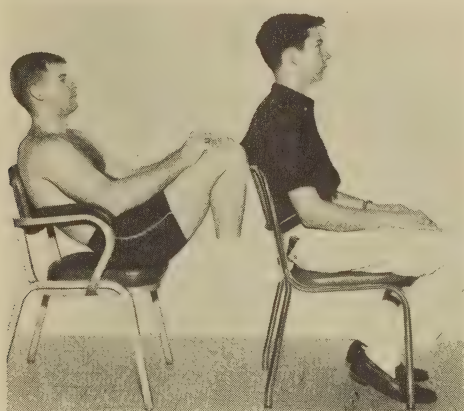
FIG. 28. Sleeping in a chair is hazardous at best. Don't try taking a nap in a chair like this one.

WAYS TO AVOID BACK STRAIN WHILE SITTING

When you sit, always keep at least one knee higher than your hip.

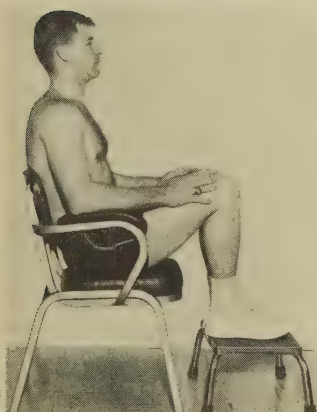


Legs crossed.

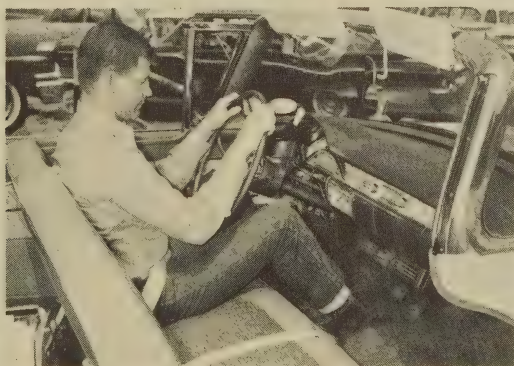


Feet propped up.

FIGS. 29 to 33 illustrate various methods used to relieve the swayed back and the thrust-forward head. This is best accomplished by keeping the knees higher than the hips and supporting the arms.



Feet on stool.



Car seat moved up.

YOUR BACK AT WORK

INCORRECT

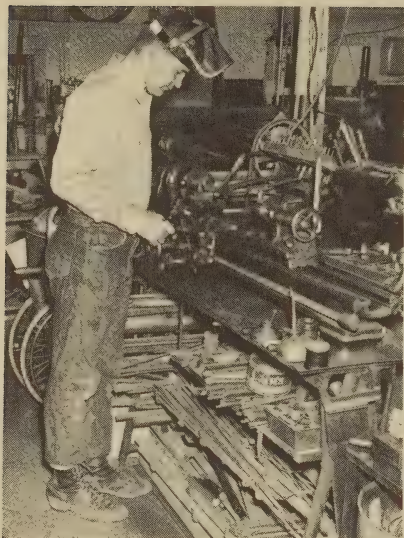


FIG. 34. Back curved.

BETTER

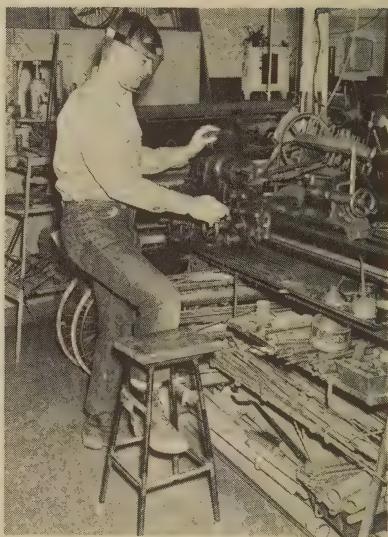


FIG. 35. Foot on stool straightens back.

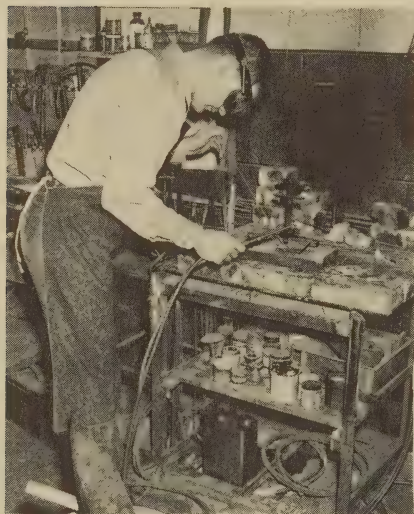


FIG. 36. Standing to weld strains back.



FIG. 37. Seated with knee raised.

INCORRECT



FIG. 38. Standing in improper footing.

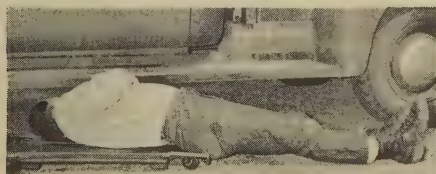


FIG. 40. Lying on creeper like this curves back.



FIG. 42. Leaning forward with knees straight strains your back.

BETTER



FIG. 39. Standing on ladder properly.



FIG. 41. With knees bent back is flattened.



FIG. 43. Deeply bent knees relieve strain on back.

WHAT TO DO IF YOUR BACK GETS A SUDDEN "CATCH" (MUSCLE SPASM—LUMBAGO)



FIG. 44. This position is an ideal one to relieve back strain and leg ache. The platform under the legs should be high enough to exert a mild upward lift on the hips. A pillow or something soft can be placed under the legs if the muscles are sore. Remain in this position until maximum relief has been obtained. This requires from 5 to 25 minutes and can be repeated several times daily.



FIG. 45. Illustrates how low back strain or sciatica is treated conservatively in a hospital. Note that the hips lie on the far side of the V made by the hospital bed. The corset around the hips is attached to ropes and weights which pull out or stretch the lower back with the hips and the knees bent. If you can arrange your bed like this at home, it would be helpful. In some instances this traction apparatus could also be utilized at home.



FIG. 46. The "cowboy crouch" position for a few minutes, as illustrated in this photograph, will relax the low back if you have had to stand for a period of time.

If there is marked "bloating" or a painful abdomen following a back injury, see your physician.

If you are attending a man who has had a severe fall or injury, never lift him in a "jackknifed" position, as a spinal injury (paralysis) may result if the vertebrae have been fractured. Protect the man from exposure and wait for a rigid stretcher.

REMEDIAL EXERCISES FOR THE BACK



Remedial exercises are designed to strengthen a back that has been weakened by a strain, defect, disease, or a simple lack of exercise. Your physician will advise you when it is time to start exercises if there has been an injury or back operation. If you have been inactive for a period of time and have become "soft," it is well to perform these exercises for several days prior to tackling a job which may strain your back. This would apply also if your job and hobbies do not

afford much exercise and if you plan a vacation or outing which will require vigorous physical activity.

Much of the pain that occurs in the back is due to tiring or fatigue of the structures that must keep the spine erect. This is particularly true of pain that is better upon arising in the morning and gets progressively worse as the day goes along. If a back has been placed at rest (following injury or sedentary occupation), the abdominal muscles become weaker than the other muscles balancing the back. Therefore, it is necessary to exercise so as to strengthen the abdominal muscles and 'stretch out the back muscles that become stiff and contracted during inactivity.

Start the exercises slowly and then, if tolerated, gradually increase until they are being done three times daily. If the exercises cause soreness next morning, reduce the frequency they are done until your strength builds up.

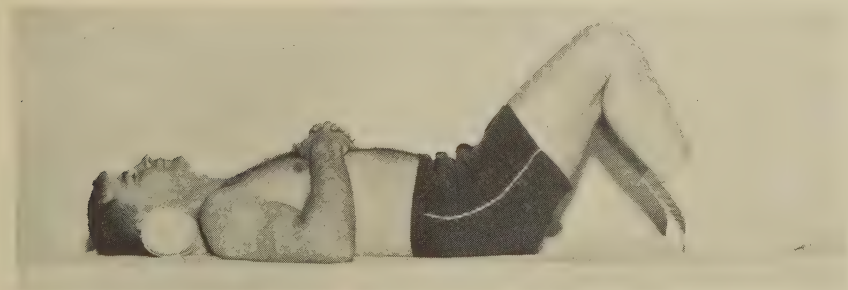
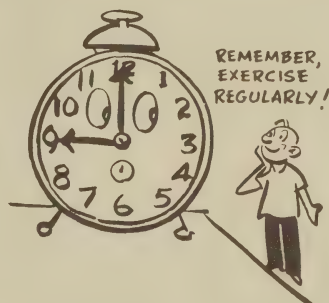


FIG. 47. This is the starting position of all exercises. Knees and hips bent with back flat against the surface and neck comfortably supported. Do all exercises very slowly.

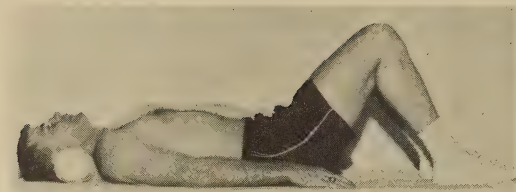


FIG. 48. Exercise 1. Take a deep breath, expanding the chest as much as possible, exhale slowly, allowing the chest to return to its normal position. Keep the back and neck flat. Repeat this deep breathing exercise very slowly 5 or 6 times.



FIG. 49. Exercise 2. Draw one knee up to the chest, bring it up tight with the hand, then return it slowly to the original position. Do not allow the knee to straighten out. Next, draw the other knee up to the chest, then return it to the original position (keeping knee bent). Repeat with each leg from 10 to 20 times.

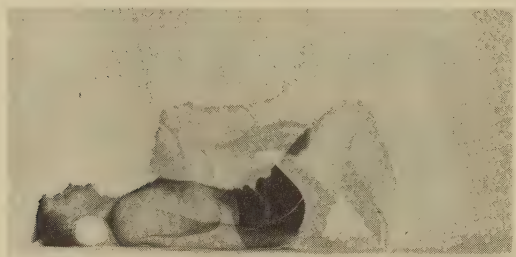


FIG. 50. Exercise 3. Draw both knees to the chest, then grasp the knees with the hands, drawing the knees as near to the chest as possible. This can be repeated 5 or 6 times. It is well to hold the knees pressed against the chest for 25 seconds each time. Before raising the knees, tighten the abdominal muscles and hold the back flat.

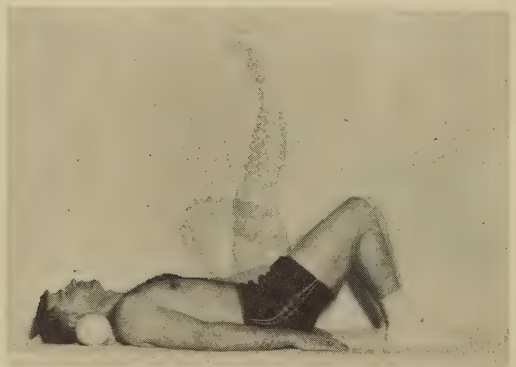


FIG. 51. Exercise 4. Draw one knee to the chest, then straighten that knee, pointing the leg upward as far as possible, bend knees and return to original position. Alternate with the opposite leg, repeating this cycle 4 or 5 times.

FIG. 52. Exercise 5. Do not start this exercise until the others have been done for 3 or 4 weeks. Draw both knees to the chest, then straighten both, pointing the feet upward; return to original position. This can be repeated 3 or 4 times.

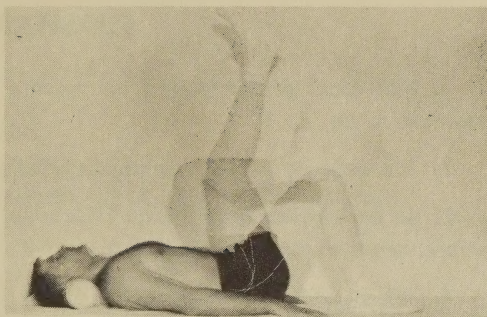


FIG. 53. Exercise 6. It requires a strong back and abdominal musculature to accomplish this exercise. The back must be kept flat at all times or low back strain could occur. Do not attempt this exercise until all soreness has disappeared from the back.

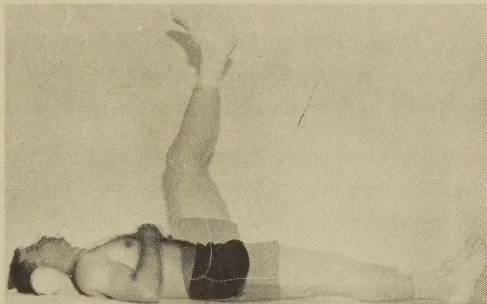
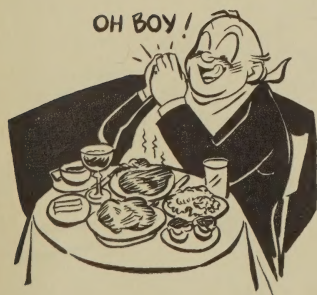
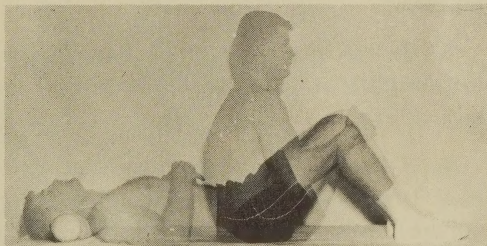


FIG. 54. Exercise 7. Pull up to the sitting position, keeping the knees flexed at all times. This exercise can be facilitated by having someone hold the feet to the floor or by hooking them under a piece of heavy furniture.



When you have accomplished the above exercises, you may proceed with "sitting up" exercises used in the Armed Services, or general outdoor recreation and hobbies. Continue to do them 3-5 times every night or every morning to help keep in shape.

REMEMBER

The smaller the waist line, the smaller the strain on the low back.

SUMMARY

1. Most back strains result from making the back do more than it has the strength to do.
2. The majority of back strains heal when restraining the back is avoided.
3. As the swayed-in position of the lower back is its weakest point, to avoid strain means to avoid increasing the curve in the lower back at all times.
4. When doing anything that requires standing, place one foot on something that will bend the knee and hip and flatten the lower back.
5. When sitting, keep one or both knees higher than the hips. Cross the legs or place the feet on a stool, keeping the knees bent. When driving a car, keep the seat close to the pedals to elevate the knees.
6. As a measure to improve low back sway, bending exercises to strengthen the abdominal muscles are helpful. These exercises also stretch the contracted low back muscles.
7. Correct deficiencies or diseases which weaken the back structures. It is usually necessary to consult your physician to detect and correct these problems.
8. Do not lose sleep or go beyond your endurance. Rest before you get too tired, but sufficient general exercise is necessary to prevent weakness from lack of use.
9. If you have more than average amount of low back sway, or if your back is strained, special remedial exercises must be done before excessive general exercise is attempted.
10. Remember the importance of weight control. The smaller the waist-line, the smaller the strain on the low back.



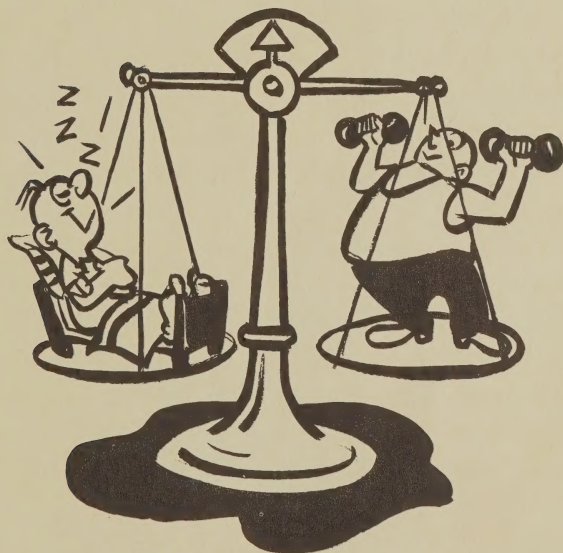
REMINDER

Back strains result if:

1. Your job is too big; or,
2. Your back isn't strong enough; or,
3. You keep driving yourself after you are worn out.

To avoid strain:

1. Use judgment in handling your job.
2. Always keep your back strong by proper exercise.
3. Rest when tired and do not lose sleep.



*A BALANCE BETWEEN
REST AND EXERCISE*

PERSONAL NOTES